

SPR - PART II
FY 2006 RESEARCH WORK PROGRAM



**RESEARCH AND
TECHNOLOGY**

PREPARED FOR THE
RHODE ISLAND DEPARTMENT OF TRANSPORTATION
BY THE
RESEARCH AND TECHNOLOGY SECTION

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Task: SPR-2(29) 2200

I. Introduction

- The Research and Technology (R&T) section is part of the Transportation Development division of the Rhode Island Department of Transportation. One of the four primary functions of R&T is the responsibility to administer and execute the research program of the RIDOT.
- The research program is funded with State Planning and Research monies. Federal funds from Appropriation Code 086, "Mandatory 25% Research, Development and Technology Transfer Activities" are utilized under Federal-Aid Project SPR-2(29). The program will be executed according to guidelines under the Mandate of 23 CFR Research Manual.

Organization of Research Effort

- *Research and Technology Development Organization:* In accordance with our organization chart the Research Unit under M. Sock performs duties with administrative guidance from F. Manning and D. Munroe (see page 33 for R&T organization chart and page 32 for RIDOT).
- *Research Manual:* The RIDOT research effort is operated in accordance with the guidelines set forth in the RIDOT Research Manual.
- *R.I.D.O.T. Research Advisory Committee (RRAC):* The RRAC was formed shortly after the research responsibility was handed over to the R&T section in July, 1993. Its members are made up from the main divisions of RIDOT and from the FHWA.
 - The committee is charged with assisting R&T in determining research needs and issues that require study. The committee will also solicit problem statements and review and assist in prioritizing the same.
 - Technical monitors for research projects funded directly by RIDOT and through New England Transportation Consortium (NETC) will be nominated by the RRAC to ensure flow of the research program.
- *Joint Research Advisory Committee (JRAC):* The JRAC was initiated by the Director of Transportation to facilitate greater cooperation between the state university (URI) and RIDOT by working within the framework of a memorandum of understanding (MoU) to determine the necessity and priority of research programs to be carried out through the Joint Transportation Research Program. The functions of this program are: To conduct basic studies of materials used in transportation; to facilitate economical design, construction, and maintenance of state transportation facilities; and to investigate traffic engineering, transportation planning, safety, and other related items as desired and agreed upon.
- *Membership in Other Organizations:* The R&T Managing Engineer is a member of the following organizations: National Cooperative Highway Research Program (NCHRP), New England

Transportation Consortium (NETC), Transportation Research Board (TRB), National Transportation Product Evaluation Program (NTPEP), American Association of State Highway and Testing Officials (AASHTO) Standing Committee on Research (SCOR), AASHTO Sub Committee on Materials (S.O.M), AASHTO Region 1 Research Advisory Committee (RAC), and actively participates in the same. R&T is also represented in Northeastern Paint Coatings (NEPCOAT), Pavement Preservation E.T.G.

- Several members of the R&T staff participate in technical panels for NCHRP.
- Future research projects and studies will be aligned thematically. That is, an attempt will be made to categorize research and examine issues comprehensively. While it is not practical for RIDOT to fund projects on a scale that will encompass all aspects of an issue, several projects working at a problem from different angles may yield a complete picture and do so more cost effectively. These themes will include protective coatings for steel, concrete durability, maintenance of traffic flow and the use of composites for reinforcement and protection of concrete, landscaping, and erosion control.
- R&T is currently broadening the resources available to the department for research and forensic studies by developing partnerships with other research institutions, such as the URI Transportation Center (URITC), Brown University. This will allow RIDOT to tap a greater range of expertise and respond more rapidly to technical issues as they arise.
- R&T is in discussion with the North East States and New York Department of Transportation to enter into joint research on issues of common interest in Pavement Preservation through the Pooled Fund Program.

Accomplishments

- *Research Administration (Task SPR 2(29) 2200)*: The administration of the research effort includes the review of research issues, project management of all contracted and in house research projects including pooled fund studies, fiscal management, and activities as described herein.
- *TRB, under Task 2(29) 2201*: RIDOT is a contributing member of the TRB and receives research publications and technical bulletins for review and distribution. Also, hold active membership in two TRB subcommittees.
- *NCHRP*: As contributing members of NCHRP, we process and review proposals for pooled research and are participating in new research projects via research panel membership. The R&T Managing Engineer participates as a member of the AASHTO SCOR.

Involvement:

- *NETC*: NETC is a consortium of the six New England states created for the purpose of pooling their academic, professional, and financial resources in dealing with research and development issues. R&T has membership on the Advisory Committee and coordinates local activity within the state (URI).

- *NTPEP, under Task 2(29) 2201:* Rhode Island is a member on 3 panels; joint sealers, rapid setting concrete patch materials and geotextiles.
- *AASHTO S.O.M.:* R&T participates in the AASHTO S.O.M. Mr. Franco is the chairman of Tech Section 4d (Safety Devices) as well as a member of other tech sections.
- *AASHTO S.C.O.R.:* Mr. Franco is the regional representative for AASHTO Region One on S.C.O.R.
- *Pavement Preservation E.T.G.:* Mr. Franco is a member of the E.T.G.

Expenditure/Policy Notes:

- Funds have been set aside for RIDOT Research Advisory Committee Members to attend the Annual Transportation Research Board meeting in Washington, D.C. Exposure to the concepts there will broaden the understanding of the committee members of the areas currently being explored in research.
- Funds will also be made available to pay for the costs for the technical monitors to participate in technical committees for such national organizations as ASTM and NCHRP.
- The status of a number of long-running projects and yet-to-be-finalized proposals will be examined and evaluated to determine whether there is sufficient value in continuing the process. If it is decided that there is not, the projects/proposals will be terminated. Proposals with significant intrinsic merit may be re-solicited.

II. Completed Projects

The projects listed below have been completed, FHWA has approved the final report, copies of which have been distributed to all interested parties:

- 2215 - Behavior of Pot Bearings on Highway Bridges (URI)
- 2217 - Seasonal Variation of Soil Resilient Modulus for Rhode Island (URI)
- 2219 - Feasibility of Predicting the Fatigue Life of Steel Bridges Using a Fatigue Fuse (URI)
- 2220 - Estimation of Layer Coefficients for the Design of Flexible Pavement Facilities in Rhode Island (URI)
- 2221 - Monitoring Long Term Creep and Temperature Behavior of the Jamestown-Verrazzano Bridge (URI)
- 2222 - The Effectiveness of Penetrant-Class Concrete Surface Sealers in Protecting Concrete Structures from Freeze-Thaw Deterioration (RIDOT)
- 2223 - Characterization of Roadway Runoff (URI)
- 2224 - The Viable Use of Crumb Rubber for Highway Construction in Rhode Island (URI)
- 2225 - Assessment of Water Pollutants from Asphalt Pavement Containing Recycled Rubber (URI)
- 2226 - Fatigue Strength of Deteriorated and Previously Stressed Highway Bridges (URI)
- 2227 - Development of Design Parameters for Pavement Structures in Rhode Island (URI)
- 2228 - Expansion Joint Elimination For Steel Highway Bridges (URI)
- 2229 - Determination of Chloride Permeability of Concrete by Total Chloride Analyses (RIDOT)
- 2232 - Independent Assurance Variation Limits (URI)
- 2234 - Alternative Low Cost Retaining Walls (URI)
- 2235 - Evaluation of Fatigue Cracking and Permanent Deformation Resisting Characteristics of Asphalt Binder (URI)
- 2236 - CADD-based Simulation of the Impact Between a Vehicle and a Roadside Feature (URI)
- 2240 - Low-Temperature Cracking Resistance Characteristics of Recycled Asphalt Pavement Binder (URI)
- 2243 - Processing and Characterization of Lightweight Concrete Using Cenospheres (URI)
- 2246 - Attenuation Of Roadway Runoff (URI)
- 2249 - Remote Bridge Monitoring – A Survey (URI)
- 2255 - Durability and Performance of Novel Concrete-Cenosphere Composites in Extreme Environments (URI)

2258 - A Design of Experimental Approach to Study the Display of Variable Message Signs (URI)

2263 - Effects of Road Marking Luminance Contrast on Driving Safety (URI)

The final draft report is being revised for the following projects:

2239 - Geosynthetics for Soft Shoulder Stabilization (URI – G. Veyera)

2241 - Repair of Steel Reinforced Concrete Structures (URI – R. Brown)

2242 - Determination of Optimum Moisture Content (OMC) and Maximum Dry Density of Soils Through the Use of a SHRP Gyratory Compactor (RIDOT – Frament)

2251 - Development of Subsurface Exploration Database and the Use of GIS Capabilities to Display and Create Subsurface Maps and Data Profiles for RIDOT Facilities Design and Construction (URI – Veeger, Boothroyd, Hamidzada, Hermes & Murray)

2265 - Evaluation of Aggregate Gradation and Master Ranges on Performance of Asphalt Mixes (URI – Lee and Shukla)

2266 - Failure Analysis of Breakaway Couplings on Light Poles (URI – Brown)

2267 - A Study of the Residual Properties and Structure of High Mast Poles (URI – Brown)

2273 - Enhancing Motorist Understanding of Variable Message Sign Messages (URI – Wang)

III. On Going Projects

2237 - Determining Water Content of Fresh Concrete – SHRP Test Method Number 2027 (RIDOT – Difilippo)

2238 - Implementation and Evaluation of Strategic Highway Research Program (SHRP) Test Method Number 2030 – Improved Sampling and Testing for Chloride in Concrete (RIDOT – Bak) , *PENDING*

2245 - Investigation of the Strength of Concrete Composite Joint Strength Subjected to Corrosive Environments (URI – Brown)

2250 - A Study Of Stainless Steel Reinforcement To Replace Carbon Steel Reinforcement (URI – Brown)

2252 - Development of Soil Mix and Plant Materials for Washington Bridge #200 Reconstruction (URI – B. Maynard)

2253 - Evaluation of Varying Asphalt Overlays Placed Over Simulations of Existing Structures Through the Use of a Pavement Analyzer (RIDOT – Frament), *PENDING*

2259 - Behavior of Modified Concrete Mixes Subjected to Dynamic Loading (RIDOT – Sock)

2260 - An Analysis of Cracking and Road Conditions in Rhode Island (RIDOT – Byrne)

2264 - Field Performance of Hydrodynamic Separator Units (URI- Thiem)

- 2268 - Analysis of Aggregate Aspect Ratio and Void Structure within Portland and Bituminous Cement Concrete Matrices by Use of a Neural Network (RIDOT – Byrne)
- 2269 - Effect of Dust in Asphalt Binder (RIDOT – I. Frament)
- 2270 - Harnessing the Power of Relational Databases (URI – Veeger, Hermes, Murray, Boothroyd & Hamidzada)
- 2272 – Fiber-Reinforced Lightweight Shotcrete for Repair of Concrete Structures (URI – Greenfield, Bose, Brown & Shukla)
- 2274 - Characterization of the Rate Constant of Pozzolan Available Alkalis (RIDOT – Foisey)
- 2275 - The Feasibility of Portable Digital Assistants (PDA) for On-Site Reference and Data Tracking in Highway Construction Projects (RIDOT – Xenophontos & Sock)
- 2276 - A Comparison Between Metalizing and Galvanizing for Corrosion Protection of Highway Structures (URI – R. Brown)
- 2277 - Liquefaction Potential of Inorganic and Organic Silts (URITC – Baxter & Veyera)
- 2278 - Trade-Off Between Cyclist Safety and Widths of Bicycle and Adjacent Parking Lanes (URI – Thomas)
- 2279 - Design of Existing Simple Span Bridges Made Continuous (URI - Tsiatas & Lee)
- 2285 - Testing Models of Asphalt System Modification Using Molecular Simulation (URI – Greenfield)
- 2287 - Employing Graphics to Aid Message Display on Dynamic Message Signs (URI – Wang)

IV. New Projects

The following problem statements have been accepted by the JRAC and RRAC and proposals are now being solicited from the principal investigator. The proposals will be forwarded to FHWA for approval upon acceptance by RIDOT.

- 2257 - A Comparison of the Performance of Various Surface Finishes for Steel Reinforcement in Concrete (URI – Brown & Lee), on-hold
- 2271 - Effect of Binder Grade on the Performance of Rhode Island Hot Mix Asphalt (URI – Lee)
- 2280 - Evaluation of the Ductility and Elastic Recovery of Asphalt Based Systems (RIDOT – Materials)
- 2281 - Evaluation of Off-the-Shelf Antifreeze Admixtures for Concrete (RIDOT – Materials)
- 2282 - Asphalt Binder Modified with Crumb Rubber from Tires
- 2283 - Bond of Overlays
- 2284 - Determination of Interfacial Bond Behavior of Composite Concrete-Asphalt Pavement Systems (URI – Sadd)
- 2286 - Innovative Intersection Pavements for Longer Life and High Performance and Evaluation of Aggregate Gradation and Asphalt Mixture Performance (Phase II) (URI – Lee, Tsiatas, Thomas, & Park)

- 2288 - Evaluation of Native Grasses for Highway Slope Stabilization and Salt Tolerance (URI – Maynard) †
- 2289 - Assessment of Liquefaction Resistance of Rhode Island Silts using Shear Wave Velocity (URI – Baxter) †
- 2290 - In Situ Evaluation of Planter Technology – Washington bridge #200 Reconstruction (URI – Maynard) †
- 2291 - Modeling Molecular-Level Actions of Asphalt Modifiers (URI – Greenfield) †
- 2292 - Relationship between the Liquefaction Potential of Silts and SPT Results (URI – Baxter) †
- 2293 - Utilization of a Simple Performance Test System to Develop a Performance-Based Asphalt Mix Design (URI – Lee & Park) †

† *Tentative*

V. The following projects have been withdrawn:

- 2230 - Coordination for the Implementation of the Strategic Highway Research Program
- 2231 - Validation of SHRP Asphalt Specifications and Mix Designs and Innovations in Asphalt Pavement for Experiment SPS-9
- 2233 - Chemical Quality and Characterization of Road Sand Sweepings
- 2244 - Ernest Street SUPERPAVE Evaluation
- 2247 - Reducing Traffic Delays Due To Maintenance And Portable Travel Time Methods Using Camera And Video Imaging Software
- 2248 - Use Of Composite Reinforcing Bars/Grids For Bridge Decks
- 2254 - Removal of Lead Paint
- 2256 - Use of Fiber-Reinforced Polymers to Reinforce Column-Cap Joints
- 2261 - Stretching Ability of Chip Seal Membranes
- 2262 - A New Coating Process to Avoid Lead Paint Removal from Structures

VI. Special Projects/Studies/Technology Transfer

This encompasses special studies, failure investigations, and problem resolution. Over the years we have noted a need for small-scale, fast track research projects and studies, as mentioned above, that could be undertaken by various entities (e.g., RIDOT staff, URI researchers, and consultants). These include studies and projects as follows:

A. Studies

1. Finished / Accomplished

- Solvent Study: Investigate asphalt extraction solvents that could replace 1,1,1 - Trichloroethane
- Latex Bridge Deck Study: Determine whether the improvement in durability is worth the added cost.
- Los Angeles Abrasion Study: Revise RIDOT aggregate specifications.
- Highway Assessment Project: Evaluate the condition of five year old highways/highway features.
- Modified Friction Course Project: Develop a more durable layer to replace open graded asphalt friction course.
- Investigations: Settlement problems on I-95 in Cranston and on the Route 1 ramp in Narragansett.
- Silica Fume Placement Demonstration Video: Placement of the silica fume overlay on the Green State Airport connector elevated roadway.
- Breakaway Couplings I
- Highway Lighting I
- Dynamic Strength Characteristics of High Performance Concrete
- Asphalt Adhesion to Rock
- Intelligent Traffic Anomaly
- Geotechnical Guidelines (w/URI)
- Innovative Asphalt Pavement (RIDOT)

2. Studies Underway / New

- Elastomeric Mixes / Binders (RIDOT)
- Pavement Preservation Monitoring (RIDOT)
- Travel Time Prediction (w/URI)
- Asphalt Adhesion to Rock-Influence of Temperature (w/URI)
- Developing Model Asphalt Systems Using Molecular Simulation (w/URITC)
- Web-Based Relational Database Portal -Subsurface Geotechnical Data (w/URITC)
- Effect of Mix Variability on Concrete Maturity Systems (RIDOT)
- Evaluation of the Pine Rotary Asphalt Wheel Tester (RIDOT)

B. Proposed/Ongoing Studies for FY 06 (Funded under Task SPR 2(29)-2202):

- Investigate the Use of Warm Asphalt Technology for Modified Asphalts
- Investigate the Use of Highly Modified Asphalts for Use in Bridge Plug Joints
- Cable Guardrail Study – Phase II

1. Evaluation of Bridge Structure Elements and Durability Mitigation (Continuation of FY 1999 study):

Objective: To examine the components of bridge structures in light of new and existing technologies to extend the working life of bridges and reduce the maintenance requirements.

Background: The deteriorating condition of the bridges in our highway system poses a tremendous problem in the need to maintain our transit infrastructure. Exposure to road salts is responsible for many of the high repair costs for our bridges. Often the most severely affected components are in the substructure. These are the most expensive areas to repair or replace. Aside from the obvious inconvenience to the motoring public, work on the substructure generally requires raising the bridge deck to allow for the removal of material and working in confined spaces. Both of these processes are labor intensive and therefore substantially increase costs. Traffic control problems tend to be acute and the price for maintaining it has risen sharply in recent years.

Purpose of study: To identify technologies that will extend the life of the bridges in the most cost effective manner possible. It will be important to look at cost/benefit ratios and not simply the up front costs of the work to be performed. These systems will be examined for durability, difficulty in implementing and projected life span.

Cost: \$10,000, for the personnel costs for the evaluation team and to provide travel to seminars and sites where these new technologies can be viewed in practice.

Benefits: Any system that will extend the useful life of our bridges is worth examining. Bridge repairs represent a very high percentage of transportation costs and identification of practical means of lessening the frequency of the rehabilitation and replacement of bridge structures can substantially reduce those costs, freeing those funds for other purposes. In addition, interruptions in normal traffic flow can be minimized.

2. Highway Assessment, Study of Ten Year Old Projects – This study is finalized and in print:

Objective: To evaluate the condition of roads ten years after reconstruction to determine the effectiveness of design, construction and maintenance techniques.

Background: It is inevitable that some pavements perform better after a given service life than others. There can be many factors, many of which may have been unforeseen, at least in degree, at the time of the project design and construction phases. These may include drainage problems, increased traffic loading and difficulty maintaining pavement subsystems. These and other causes can serve to shorten the time expected before major repairs are required.

Purpose of Study: To determine what factors may detrimentally affect pavement systems and ascertain what may be done to better predict these factors at a point when changes can be effectively incorporated into the project design. Also, to aid in the development of preventative maintenance techniques to keep the pavements in good condition.

Cost: \$6000, for the personnel costs of the assessment team and a vehicle mounted measuring system to be used to determine distances without exposing team members to the risk of exposure to traffic.

Benefits: This study will attempt to determine the most cost effective methods for the design, construction and maintenance of roads, based on empirical analysis of roads *already in service*. In doing so, the motoring public will be provided with the best balance between the optimum riding conditions and minimum cost.

C. With the explosion of new technologies and the need to fast-track into them, we see the following as needed areas of study:

- Concrete: To further study the durability of the High Performance Concrete (HPC) currently used with a view toward enhancing the same, with additives and admixtures. Self-consolidating concrete and UHPC will be investigated.
- Fiber Reinforced Composites (FRC): An expert group with industry, URI, and RIDOT members may be formed to implement research findings. The FHWA research office is promoting the use of FRC to strengthen and protect highway structures. URI has teamed with Rutgers University to perform an Innovative Bridge Research Concepts project to

look at a protective coating system based on an FRC. NETC is also doing a study on FRC elements.

- **Bridge Coating Systems:** A review of the viability of metalizing is due, especially considering that some RIDOT structures have had a metalized coating for as long as fifteen years, and appear to be performing exceedingly well. RIDOT is also in partnership with NEPCOAT to evaluate new and existing coating technologies.
- **Human Factors:** We would like to focus attention in this area. A more positive, proactive approach to transportation systems design would allow RIDOT to engineer highways and bridges more in keeping with the character of the culture and character of the state, rather than wait for feedback from the public after the engineering work has been done.
- **Intelligent Transportation Systems (ITS):** This is a hot topic, with technological advances occurring at a very rapid pace. There is interest in the department (especially from the Traffic Operations Center) in evaluating the new technologies for implementation in the highway system.
- **Asphalt Repair and Rehabilitation Treatments:** The RIDOT Asphalt Group is looking into crack sealing, chip sealing, slurry sealing and whitetopping, etc. in view of the fact that the RIDOT is looking into ways of making the best use of our financial resources. RIDOT is currently using many of these techniques and is constantly investigating new ones.
- **Geosynthetic:** URI has completed work on a geosynthetic reinforced wall research project and is working on a project on geosynthetic-stabilized shoulder and pavements. We are looking to instrument an MSE grid fabric-reinforced retaining wall to obtain real field data and validate design inputs.
- **Whitetopping:** This is a thin, high strength, fiber-reinforced concrete layer constructed on a milled surface at an intersection whose asphalt pavement has proven to be unstable. The RIDOT has constructed its first whitetopping project and is monitoring the same. Future projects are being discussed.
- **Modified Asphalt:** The RIDOT, in cooperation with the Hudson Companies and UMass Dartmouth, is investigating the crumb rubber modification of asphalt cement using a process developed at the FHWA's Turner-Fairbanks Highway Research Center. Asphalts modified with the process have been used on several crack seal and surface seal projects.
- **Integration and Digitization of Data Collection and Tracking Systems:** Most data collected in the field is ultimately stored electronically, although much of it is originally recorded by hand. Initiatives in the Department in recent years have increased digitization of data generated in offices and the next phase would be to extend this to field offices. The current PDA project is a step in this direction. As the technology becomes less expensive and more prevalent, the conversion from paper data entry to electronic will continue and a flexible plan should be in place to prevent a haphazard array of systems.

VII.

Appendices

Table 1: SPR 2(29), PART II FISCAL YEAR 2006
RESEARCH ADMINISTRATION, STUDIES AND POOLED FUNDS - ACCOUNT STATUS AS OF 6/30/05

PROJECT TYPE	DESCRIPTION	PROJECT AMOUNT FY 05	EST. EXPENDITURES AS OF 6/30/05	ESTIMATED COST FY 06
ADMIN	R&T PERSONNEL SERVICES I	\$35,000	\$50,000	\$45,000
ADMIN	PERSONNEL SERVICES II (PROJ. TECHNICAL & PROGRAM MONITORS)	\$26,000	\$3,000	\$24,000
ADMIN	CONTINGENCY	\$75,000	\$2,500	\$75,000
ADMIN	TRAVEL (AASHTO RAC/SOM, NESMEA, NTPEP, PEER EXCHANGE, TRB)	\$10,000	\$7,000	\$10,000
ADMIN	CAPITAL COST – GENERAL	\$900	\$600	\$2,300
	<i>TOTAL ADMINISTRATION [SPR-2(29)-2200] :</i>	<i>\$146,900</i>	<i>\$63,100</i>	<i>\$156,300</i>
POOLED FUND	NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP)	\$167,110	\$203,659	\$194,889
POOLED FUND	NEW ENGLAND TRANSPORTATION CONSORTIUM (NETC)	\$124,000	\$100,000	\$100,000
POOLED FUND	NATN'L TRANS. PRODUCT EVAL'N. PROGRAM (NTPEP) * SPR-2(29)2201	\$6,000	\$6,000	\$4,500
POOLED FUND	TRANSPORTATION RESEARCH BOARD (TRB) * SPR-2(29)2201	\$64,635	\$64,635	\$64,635
POOLED FUND	TRAFFIC MANAGEMENT CENTER CONSORTIUM	\$15,000	\$15,000	\$15,000
POOLED FUND	GUIDELINES DEVELOPMENT FOR SELECTION OF CRACK SEALANTS	\$20,000	\$20,000	\$20,000
POOLED FUND	COORDINATION OF PAVEMENT ACTIVITIES IN THE NORTHEAST	\$5,000	\$5,000	\$5,000
POOLED FUND	PERFORMANCE GRADE BINDERS	\$0	\$0	\$30,000
	<i>TOTAL POOLED FUNDS: [SPR-2(29)-2201]</i>	<i>\$401,745</i>	<i>\$414,294</i>	<i>\$434,024</i>
STUDY-99-3	HIGHWAY ASSESSMENT, STUDY OF TEN YEAR OLD PROJECTS	\$4,900	\$0	\$155
STUDY-99-4	RAPID CHLORIDE PERMEABILITY OF PLANT CONCRETE MIXES	\$5,000	\$5,000	\$0
STUDY-00-1	EVAL'N. OF SUBSTRUCTURE ELEMENTS BY IMPACT ECHO LOCATION	\$35,000	\$23,800	\$11,200
STUDY-00-2	EVAL'N. OF EXISTING STEEL REINFORCEMENT IN OLDER STRUCTURES	\$6,000	\$2,500	\$3,500
STUDY-01-3	GEOTECHNICAL GUIDELINES	\$26,099	\$14,500	\$11,599
STUDY-02-5	INTELLIGENT TRAFFIC ANOMALY	\$23,609	\$0	\$23,609
STUDY-03-1	ASPHALT ADHESION TO ROCK-INFLUENCE OF TEMPERATURE	\$26,100	\$0	\$26,100
STUDY-03-2	PAVEMENT PRESERVATION MONITORING	\$6,000	\$0	\$6,000
STUDY-03-3	INNOVATIVE ASPHALT PAVEMENT	\$109,410	\$98,505	\$0
STUDY-04-1	DEV. MODEL ASPHALT SYSTEMS USING MOLECULAR SIMULATION	\$35,307	\$0	\$35,307
STUDY-04-2	WEB-BASED REL. DATABASE PORTAL -SUBSURFACE GEOTECH DATA	\$47,787	\$0	\$47,787
STUDY-04-3	EFFECT OF MIX VARIABILITY ON CONCRETE MATURITY SYSTEMS	\$7,183	\$2,495	\$4,688
STUDY-05-1	EVALUATION OF THE PINE ROTARY ASPHALT WHEEL TESTER	\$9,000	\$2,100	\$6,900
<i>TOTAL: STUDIES [SPR-2(29)-2202]</i>		<i>\$341,395</i>	<i>\$148,900</i>	<i>\$184,845</i>
TOTAL		\$890,040	\$626,294	\$767,169

Notes:

- 1] The Capital Costs through 6/30/05 include expenditures for the forensic studies
- 2] The contingency costs are estimates that carry over; the balance of funds not expended carry over.
- 3] Travel to TRB includes costs for RIDOT Research Advisory Committee members.

**Table 2: SPR 2(29)2200, PART II FISCAL YEAR 2006
ADMINISTRATION PERSONNEL COSTS**

Personnel	Names	2200/ Admin.	2200/ T. Mon.	2202/ Projects	2259	2261	P.E.	CONST.	ADM	TOTAL DAYS
Managing Engineer	C. Franco	40							190	230
Pr. Civil Engineer	D. Munroe	35					70	125		230
Pr. Civil Engineer	F. Manning	40	10				65	115		230
Sr. Civil Engineer	M. Sock	30	10	20	85		65	20		230
Sr. Civil Engineer	J. Lima		10	20	15		135	50		230
Sr. Civil Engineer	M. Sherrill		10				155	65		230
Eng. Tech II	C. Corrente	10		10			75	135		230
Eng. Tech III	J. Grossi	5		10			95	120		230
<i>TOTAL</i>		<i>160</i>	<i>40</i>	<i>60</i>	<i>100</i>		<i>660</i>	<i>630</i>	<i>190</i>	<i>1,840</i>

Notes: 2200 Administrative- R&T Staff Days for Administration of Research Program
 2200 Technical Monitors- R&T Staff Days for Monitoring Research Projects
 2200 Project - R&T Staff Days for special/forensic studies
 Depending on need, the summer interns may charge up to ten days (total)

Table 3A: PART II FISCAL YEAR 2006
RESEARCH PROJECTS UNDER ISTE A - ACCOUNT STATUS AS OF 6/30/05 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/05	EXPENDITURES FY 05	PROJECT STATUS	ESTIMATED COST FY 2006
2219	ME 501	FEASIBILITY of PREDICTING the FATIGUE LIFE of STEEL BRIDGES USING a FATIGUE FUSE	\$88,750	\$83,450	\$0	COMPLETE	\$0
2220	ME 527	ESTIMATION of LAYER COEFFICIENTS for the DESIGN of FLEXIBLE PAVEMENT FACILITIES in RHODE ISLAND	\$186,750	\$186,500	\$0	COMPLETE	\$0
2221	CA97045	MONITORING of LONG TERM CREEP and TEMPERATURE BEHAVIOR of the JAMESTOWN-VERRAZZANO BRIDGE	\$60,478	\$51,103	\$0	COMPLETE	\$0
2224	ME 217	The VIABLE USE of CRUMB RUBBER for HIGHWAY CONSTRUCTION in RHODE ISLAND	\$157,950	\$156,845	\$0	COMPLETE	\$0
2226	CA97066	FATIGUE STRENGTH of DETERIORATED and PREVIOUSLY STRESSED HIGHWAY BRIDGES	\$51,491	\$51,491	\$0	COMPLETE	\$0
2227	CA97065	DEVELOPMENT of DESIGN PARAMETERS for PAVEMENT STRUCTURES in RHODE ISLAND	\$74,828	\$74,828	\$0	COMPLETE	\$0
2228	CA97064	EXPANSION JOINT ELIMINATION for STEEL HIGHWAY BRIDGES	\$58,309	\$58,309	\$0	COMPLETE	\$0
2232	5420632	INDEPENDENT ASSURANCE VARIATION LIMITS	\$37,000	\$32,791	\$0	COMPLETE	\$0
2234	5420534	ALTERNATIVE LOW COST RETAINING WALLS	\$71,479	\$71,479	\$0	COMPLETE	\$0
2236	CA96036	CADD-BASED SIMULATION of the IMPACT BETWEEN a VEHICLE and a ROADSIDE FEATURE	\$37,086	\$37,086	\$37,086	COMPLETE	\$0
TOTAL			\$824,121	\$803,882	\$37,086	-	\$0

Table 3B: PART II FISCAL YEAR 2006
RESEARCH PROJECTS UNDER TEA-21 - ACCOUNT STATUS AS OF 6/30/05 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/05	EXPENDITURES FY 05	PROJECT STATUS	ESTIMATED COST FY 2006
2237	----	DETERMINING WATER CONTENT of FRESH CONCRETE - SHRP TEST METHOD NUMBER 2027	\$8,838	\$0	\$0	ACTIVE	\$8,838
2238	----	IMPLEMENTATION and EVALUATION of SHRP TEST METHOD 2030 - IMPROVED SAMPLING and TESTING for CHLORIDE in CONCRETE	\$29,150	\$0	\$0	PENDING	\$0
2239	5420639	GEOSYNTHETICS for SOFT SHOULDER STABILIZATION	\$48,354	\$31,416	\$0	ACTIVE	\$16,938
2240	5420540	LOW-TEMPERATURE CRACKING RESISTANCE CHARACTERISTICS of RECYCLED ASPHALT PAVEMENT BINDER	\$74,940	\$74,940	\$0	COMPLETE	\$0
2241	5420541	REPAIR of STEEL REINFORCED CONCRETE STRUCTURES	\$61,977	\$60,000	\$0	DRAFT REPORT	\$1,977
2242	----	SHRP GYRATORY SOIL COMPACTION	\$64,500	\$39,831	\$0	ACTIVE	\$24,669
2243	5420643	PROCESSING and CHARACTERIZATION of a LIGHTWEIGHT CONCRETE USING CENOSPHERES	\$74,827	\$74,827	\$0	COMPLETE	\$0
2245	5420645	INVESTIGATION of the STRENGTH of CONCRETE COMPOSITE JOINT STRENGTH SUBJECTED to CORROSIVE ENVIRONMENTS	\$79,201	\$35,000	\$35,000	ACTIVE	\$44,201
2246	5420646	ATTENUATION of ROADWAY RUNOFF	\$82,361	\$82,361	\$2,000	COMPLETE	\$0
2249	5420749	BRIDGE INSTRUMENTATION and REMOTE MONITORING	\$44,969	\$44,969	\$0	COMPLETE	\$0
2250	5420650	A STUDY of STAINLESS STEEL REINFORCEMENT to REPLACE CARBON STEEL REINFORCE'T.	\$74,999	\$50,000	\$30,000	ACTIVE	\$24,999

Table 3B: PART II FISCAL YEAR 2006
RESEARCH PROJECTS UNDER TEA-21 - ACCOUNT STATUS AS OF 6/30/05 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/05	EXPENDITURES FY 05	PROJECT STATUS	ESTIMATED COST FY 2006
2251	54200651	DEVELOPMENT of SUBSURFACE EXPLORATION DATABASE & the USE of GIS CAPABILITIES to DISPLAY & CREATE SUBSURFACE MAPS & DATA PROFILES for RIDOT FACILITIES DESIGN & CONSTRUCTION	\$100,094	\$90,000	\$0	DRAFT REPORT	\$10,094
2252	2282252	DEVELOPMENT of SOIL MIX & PLANT MATERIALS for WASHINGTON BRIDGE #200 RECONSTRUCTION	\$40,085	\$30,000	\$30,000	ACTIVE	\$10,085
2253	----	EVALUATION of VARYING ASPHALT OVERLAYS PLACED OVER SIMULATIONS of EXISTING STRUCTURES THROUGH the USE of a PAVEMENT ANALYZER	\$107,000	\$0	\$0	PENDING	\$0
2255	5430655	DURABILITY & PERFORMANCE of NOVEL CONCRETE-CENOSPHERE COMPOSITES in EXTREME ENVIRONMENTS	\$75,000	\$75,000	\$0	COMPLETE	\$0
2257	----	A COMPARISON of the PERFORMANCE of VARIOUS SURFACE FINISHES for STEEL REINFORCEMENT in CONCRETE	\$66,970	\$0	\$0	ON HOLD	\$0
2258	5430658	A DESIGN of EXPERIMENTAL APPROACH to STUDY the DISPLAY of VARIABLE MESSAGE SIGNS	\$46,491	\$46,491	\$0	COMPLETE	\$0
2259	----	BEHAVIOR of MODIFIED CONCRETE MIXES SUBJECTED to DYNAMIC LOADING	\$142,809	\$137,351	\$4,018	ACTIVE	\$5,458
2260	----	AN ANALYSIS of CRACKING and ROAD CONDITIONS in RHODE ISLAND	\$99,503	\$80,000	\$0	ACTIVE	\$19,503
2261	2272261	STRETCHING ABILITY of CHIP SEAL MEMBRANES	\$1,259	\$1,259	\$0	TERMINATED	\$0
2263	5420763	EFFECTS of ROAD MARKING LUMINANCE CONTRAST on DRIVING SAFETY	\$62,689	\$62,689	\$40,189	COMPLETE	\$0
2264	2272264	FIELD PERFORMANCE of HYDRODYNAMIC SEPARATOR UNITS	\$77,250	\$0	\$0	ACTIVE	\$77,250

Table 3B: PART II FISCAL YEAR 2006
RESEARCH PROJECTS UNDER TEA-21 - ACCOUNT STATUS AS OF 6/30/05 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/05	EXPENDITURES FY 05	PROJECT STATUS	ESTIMATED COST FY 2006
2265	2272265	EVALUATION of AGGREGATE GRADUATION & MASTER RANGES on PERFORMANCE of ASPHALT MIXTURES	\$79,936	\$74,936	\$74,936	DRAFT REPORT	\$5,000
2266	5420766	BREAKAWAY COUPLINGS – FAILURE ANALYSIS & LIFETIME PREDICTION – PROGRAM 1, TASK II	\$80,000	\$60,000	\$60,000	DRAFT REPORT	\$20,000
2267	5420767	HIGHWAY LIGHTING – FAILURE ANALYSIS & LIFETIME PREDICTION – PROGRAM 2, TASK II	\$60,000	\$40,000	\$40,000	DRAFT REPORT	\$20,000
2268	----	ANALYSIS of AGGREGATE ASPECT RATIO & VOID STRUCTURE w/in PORTLAND & BITUMINOUS CEMENT CONCRETE MATRICES by use of a NEURAL NETWORK	\$53,163	\$17,449	\$10,000	ACTIVE	\$25,414
2269	----	EFFECT of DUST in ASPHALT BINDER	\$58,250	\$46,500	\$31,488	ACTIVE	\$11,750
2270	2272270	HARNESSING the POWER of RELATIONAL DATABASES	\$43,477	\$35,255	\$20,050	ACTIVE	\$8,222
2271	----	EFFECT of BINDER on the PERFORMANCE of RHODE ISLAND HOT MIX ASPHALT	\$122,699	\$0	\$0	PENDING	\$80,000
2272	2282272	FIBER-REINFORCED LIGHTWEIGHT SHOTCRETE for PATCHING and RETROFITTING of CONCRETE STRUCTURES	\$120,001	\$0	\$0	ACTIVE	\$60,000
2273	2272273	ENHANCING MOTORIST UNDERSTANDING of VARIABLE MESSAGE SIGN MESSAGES	\$49,750	\$40,000	\$40,000	DRAFT REPORT	\$9,750
TOTAL			\$2,130,542	\$1,330,274	\$409,530	-	\$494,448

Table 3C: PART II FISCAL YEAR 2006
RESEARCH PROJECTS UNDER SAFETEA - ACCOUNT STATUS AS OF 6/30/05 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/05	EXPENDITURES FY05	PROJECT STATUS	ESTIMATED COST FY 2006
2274	----	CHARACTERIZATION of the RATE CONSTANT of POZZOLAN AVAILABLE ALKALIS	\$61,000	\$21,550	\$21,550	ACTIVE	\$39,450
2275	----	THE FEASIBILITY OF PDA's for ON-SITE REFERENCE and DATA TRACKING in HIGHWAY CONSTRUCTION PROJECTS	\$35,447	\$12,289	\$12,289	ACTIVE	\$23,158
2276	2282276	A COMPARISON BETWEEN METALIZING and GALVANIZING for CORROSION PROTECTION of HIGHWAY STRUCTURES	\$103,111	\$0	\$0	ACTIVE	\$40,000
2277	2282277	LIQUEFACTION POTENTIAL of INORGANIC and ORGANIC SILTS	\$66,374	\$26,000	\$26,000	ACTIVE	\$40,374
2278	2282278	TRADE-OFF BETWEEN CYCLIST SAFETY, BICYCLE LANE SELECTION, and WIDTHS of BICYCLE and ADJACENT PARKING LANES	\$75,000	\$20,000	\$20,000	ACTIVE	\$55,000
2279	2282279	DESIGN of EXISTING SIMPLE SPAN BRIDGES MADE CONTINUOUS	\$75,120	\$0	\$0	ACTIVE	\$50,000
2280	----	EVALUATION of the DUCTILITY and ELASTIC RECOVERY of ASPHALT BASED SYSTEMS	\$23,000	\$0	\$0	PENDING	\$18,000
2281	----	EVALUATION of OFF-the-SHELF ANTIFREEZE ADMIXTURES for CONCRETE	\$20,000	\$0	\$0	PENDING	\$10,000
2282	PENDING	ASPHALT BINDER MODIFIED WITH CRUMB RUBBER FROM TIRES	\$60,000	\$0	\$0	PENDING	\$15,000
2283	PENDING	BOND of OVERLAYS	\$50,000	\$0	\$0	PENDING	\$12,000

Table 3C: PART II FISCAL YEAR 2006
RESEARCH PROJECTS UNDER SAFETEA - ACCOUNT STATUS AS OF 6/30/05 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/05	EXPENDITURES FY05	PROJECT STATUS	ESTIMATED COST FY 2006
2284	PENDING	DETERMINATION of INTERFACIAL BOND BEHAVIOR of COMPOSITE CONCRETE-ASPHALT PAVEMENT SYSTEMS	\$75,000	\$0	\$0	PENDING	\$24,000
2285	PENDING	TESTING MODEL ASPHALT SYSTEM MODIFICATION USING MOLECULAR SIMULATION	\$27,500	\$0	\$0	ACTIVE	\$10,000
2286	PENDING	INNOVATIVE INTERSECTION PAVEMENTS for LONGER LIFE & HIGH PERFORMANCE & EVALUATION of AGGREGATE GRADATION & ASPHALT MIXTURE PERFORMANCE (P II)	\$87,000	\$0	\$0	PENDING	\$28,000
2287	PENDING	EMPLOYING GRAPHICS to AID MESSAGE DISPLAY on DYNAMIC MESSAGE SIGNS	\$16,971	\$5,046	\$5,046	ACTIVE	\$13,607
2288	PENDING	EVALUATION of NATIVE GRASSES for HIGHWAY SLOPE STABILIZATION and SALT TOLERANCE	\$63,000	\$0	\$0	PENDING	\$0
2289	PENDING	ASSESSMENT of LIQUEFACTION RESISTANCE of RHODE ISLAND SILTS using SHEAR WAVE VELOCITY	\$62,000	\$0	\$0	PENDING	\$0
2290	PENDING	UTILIZATION of a SIMPLE PERFORMANCE TEST SYSTEM to DEVELOP a PERFORMANCE-BASED ASPHALT MIX DESIGN	\$75,000	\$0	\$0	PENDING	\$0
2291	PENDING	MODELING MOLECULAR-LEVEL ACTIONS of ASPHALT MODIFIERS	\$80,000	\$0	\$0	PENDING	\$0
2292	PENDING	RELATIONSHIP between the LIQUEFACTION POTENTIAL of SILTS and SPT RESULTS	\$46,000	\$0	\$0	PENDING	\$0

Table 3C: PART II FISCAL YEAR 2006
RESEARCH PROJECTS UNDER SAFETEA - ACCOUNT STATUS AS OF 6/30/05 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/05	EXPENDITURES FY05	PROJECT STATUS	ESTIMATED COST FY 2006
<i>TOTAL</i>			<i>\$1,101,523</i>	<i>\$84,885</i>	<i>\$84,885</i>	<i>-</i>	<i>\$378,589</i>

Note: Projects 2288 through 2293 are tentatively included in the program, pending approval from the RIDOT Chief Engineer and the RIDOT Director

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8/2005

Table 4: ESTIMATED FINANCING SUMMARY SHEET
SPR-2(29)

A. FFY'06	Availability of Funds			
	Federal Funds	Federal Matching Rate	State Match	Total
SPR-Part II	\$885,857			
Less Pooled Funds:				
NCHRP	(\$194,889)	100%		
NETC	(\$100,000)	100%		
Crack Sealants	(\$20,000)	100%		
TMC	(\$15,000)	100%		
Pavement Coordination	(\$5,000)	100%		
Performance Grade Binders	(\$30,000)	100%		
Total FY 2006	\$520,968	80%	\$130,242	\$651,210

B.	Estimated Financing SPR-2(29) FY 06			
	Federal Funds	Federal Matching Rate	State Match for Eligible Funds	Total
Total FY 2006	\$885,857	80%	\$130,242	\$1,016,099

The federal funds given here are based on FY04 appropriation. The state contribution is for the amount eligible for matching after the 100% federally funded have been subtracted from the 25% (for SPR, Part II) of the 2% (for the total SPR) of the federal appropriation. The additional funds that will be required to pay for ongoing research projects will be paid for by funds originally set aside for that purpose and carried over from the year in which those funds were authorized (as shown in Table 5).

Notes:

- 1] The total estimated cost for FY06 is \$1,648,206. This is from Tables 1 and 3 (Parts A, B & C). Funding for this includes money from previous fiscal years that were committed but have not as yet been expended.
- 2] Section A shows the amount free after paying for the mandatory programs
- 3] Section B is the total finances estimated from the mandatory fund for SPR Part II

**Table 5: RESEARCH FUNDING COMMITMENTS
UNDER ISTE A PROGRAM**

	7/91-6/92 FY 92	7/92-6/93 FY 93	7/93-6/94 FY 94	7/94-6/95 FY 95	7/95-6/96 FY 96	7/96-6/97 FY 97
IA Pooled Funds:						
NCHRP	\$104,702	\$117,584	\$116,685	\$112,474	\$77,919	\$82,163
NETC	\$70,000	\$70,000	\$70,000	\$75,000	\$75,000	\$75,000
NETTCP	-----	-----	-----	-----	-----	\$13,629
SHRP (GIS)	\$197,500	\$197,500	-----	-----	-----	-----
<i>IA Total</i>	<i>\$372,202</i>	<i>\$385,084</i>	<i>\$186,685</i>	<i>\$187,474</i>	<i>\$152,919</i>	<i>\$170,792</i>
IB Mandated Funds:						
TRB	\$37,555	\$37,555	\$37,555	\$47,010	\$47,010	\$47,010
NTPEP	-----	-----	-----	\$4,500	\$4,500	\$4,500
<i>IB Total</i>	<i>\$37,555</i>	<i>\$37,555</i>	<i>\$37,555</i>	<i>\$51,510</i>	<i>\$51,510</i>	<i>\$51,510</i>
II Administration Total	\$27,070	\$33,658	\$55,081	\$58,004	\$29,879	\$48,858
IIIA URI Projects						
2219	\$88,750					
2220	\$186,750					
2221			\$51,103			
2223			\$89,819			
2224			\$157,950			
2225				\$74,100		
2226				\$51,491		
2227				\$74,828		
2228				\$58,309		
2234					\$71,479	
2235					\$74,836	
2236					\$37,086	
<i>IIIA Total</i>	<i>\$275,500</i>	<i>\$0</i>	<i>\$298,872</i>	<i>\$258,728</i>	<i>\$183,401</i>	<i>\$0</i>
IIIB. RIDOT Projects						
2222			\$73,624			
2229				\$42,431		
2232					\$40,189	
<i>IIIB Total</i>	<i>\$0</i>	<i>\$0</i>	<i>\$ 73,624</i>	<i>\$42,431</i>	<i>\$40,189</i>	<i>\$0</i>
Total Expenses	\$712,327	\$456,297	\$651,817	\$598,147	\$457,898	\$271,160
INCOME						
SPR Fed. Funds (25%) (a)	\$475,922	\$534,474	\$530,386	\$511,246	\$354,179	\$373,470
Pooled Funds (b)	\$372,202	\$385,084	\$186,685	\$187,474	\$152,919	\$170,792
(a) - (b) (c)	\$103,720	\$149,390	\$343,701	\$323,772	\$201,260	\$202,678
125%(c) (d)	\$129,650	\$186,738	\$429,626	\$404,715	\$251,575	\$253,348
<i>(b) + (d) Total Income</i>	<i>\$501,852</i>	<i>\$571,822</i>	<i>\$616,311</i>	<i>\$592,189</i>	<i>\$404,494</i>	<i>\$424,140</i>
Income minus Expenses	(\$210,475)	\$115,525	(\$35,506)	(\$5,958)	(\$53,404)	\$152,980
Total Income for ISTE A: Total Expenditures/Commitments						(\$36,839)

Note: 1] Total Expenses = IA Total + IB Total + II Total + IIIA Total + IIIB Total
2] Recalculation of the expenditures has shown that the funds committed during ISTE A were in excess of the funds received for SPR Part II. However, as many of the projects have not been completed and the full monies not disbursed, we have not exceeded our spending limits. We will request the use of TEA-21 funds to make up the shortfall, if any

**Table 6: RESEARCH FUNDING COMMITMENTS
UNDER TEA-21 PROGRAM FY98-03**

	7/97-6/98	7/98-6/99	7/99-6/00	7/00-6/01	7/01-6/02	7/02- 6/03
	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03
IA. Pooled Funds:						
NCHRP	\$143,212	\$166,686	\$178,656	\$188,760	\$193,705	\$167,110
NETC	\$131,000	\$75,000	\$100,000	\$100,000	\$100,000	\$100,000
NECEPT			\$7,507	\$4,500		
HERMES II				\$50,000		
TMC				\$15,000	\$15,000	
NCAT OGFC				\$20,000		
Crack Sealants						\$20,000
Pavement Coordination						\$5,000
<i>IA. Total</i>	<i>\$274,212</i>	<i>\$241,686</i>	<i>\$286,163</i>	<i>\$378,260</i>	<i>\$308,705</i>	<i>\$307,110</i>
IB. Mandated Funds:						
TRB	\$49,975	\$49,975	\$49,975	\$60,330	\$60,330	\$60,330
NTPEP	\$4,500	\$4,500	\$4,500	\$4,500	\$9,500	\$4,500
<i>IB. Total</i>	<i>\$54,475</i>	<i>\$54,475</i>	<i>\$54,475</i>	<i>\$64,830</i>	<i>\$64,830</i>	<i>\$64,830</i>
IIA. Administration Total	\$53,619	\$63,506	\$106,958	\$107,000	\$79,700	\$76,009
IIB. Studies Total				\$96,019	\$68,228	\$191,510
IIIA. URI Projects						
2 (26) – 2239	\$75,000					
2 (26) – 2240	\$74,940					
2 (26) – 2241	\$61,977					
2 (26) – 2243			\$74,827			
2 (26) – 2245			\$79,201			
2 (26) – 2246			\$82,361			
2 (26) – 2249			\$44,969			
2 (26) – 2250			\$74,999			
2 (26) - 2251				\$100,094		
2 (26) - 2252				\$40,085		
2 (26) – 2255				\$75,000		
2 (26) – 2257				\$66,970		
2 (26) – 2258				\$46,491		
2 (27) - 2261					\$1,259	
2 (27) – 2263					\$62,689	
2 (27) – 2264					\$77,250	
2 (27) – 2265					\$79,936	
2 (27) – 2266					\$80,000	
2 (27) – 2267					\$60,000	
2 (27) – 2270						\$43,477
2 (27) – 2271						\$87,000
2 (27) – 2272						\$120,001
2 (27) – 2273						\$49,750
<i>IIIA. Total</i>	<i>\$211,917</i>	<i>\$0</i>	<i>\$356,357</i>	<i>\$328,640</i>	<i>\$361,134</i>	<i>\$300,228</i>
IIIB. RIDOT Projects						
2 (26) – 2237	\$8,838					
2 (26) – 2238	\$29,150					

**Table 6: RESEARCH FUNDING COMMITMENTS
UNDER TEA-21 PROGRAM FY98-03**

2 (26) – 2242			\$64,500				
2 (26) – 2253				\$107,000			
2 (27) – 2259					\$142,809		
2 (27) – 2260					\$99,503		
2 (27) – 2268						\$60,000	
2 (27) – 2269						\$30,000	
IIIB. Total		\$37,988	\$0	\$64,500	\$107,000	\$242,312	\$90,000
Total Expenses		\$632,211	\$359,667	\$868,453	\$1,081,749	\$1,129,909	\$1,029,687
INCOME							
SPR Fed. Funds (25%)	(a)	\$650,966	\$757,663	\$812,074	\$787,250	\$858,000	\$759,591
Pooled Funds	(b)	\$274,212	\$241,686	\$286,163	\$378,260	\$308,705	\$307,110
(a) - (b)	(c)	\$376,754	\$515,977	\$525,911	\$408,990	\$549,295	\$452,481
125%(c)	(d)	\$470,943	\$644,971	\$657,389	\$511,238	\$686,619	\$565,601
(b) + (d) Total Income		\$745,155	\$886,657	\$943,552	\$889,498	\$995,324	\$872,711
Income minus expenses		\$112,944	\$526,990	\$75,099	(\$192,252)	(\$134,585)	(\$156,976)
Total Income for TEA-21: Total Expenditures/Commitments							\$231,226

Note: 1] Total Expenses = IA Total + IB Total + IIA Total + IIB Total + IIIA Total + IIIB Total
2] In FY 98, \$56,000 in SPR funds was provided through NETC to purchase dynamic shear rheometers for the six New England states' materials testing sections.

Table 7: RESEARCH FUNDING COMMITMENTS
UNDER SAFETEA / SAFETEA-LU PROGRAM FY04-09

	7/03-6/04 FY 04	7/04-6/05 FY 05	7/05-6/06 FY 06	7/06-6/07 FY 07	7/07-6/08 FY 08	7/08- 6/09 FY 09
IA Pooled Funds:						
NCHRP	\$167,110	\$203,659	\$194,889			
NETC	\$124,000	\$100,000	\$100,000			
TMC	\$15,000	\$15,000	\$15,000			
Crack Sealants	\$20,000	\$20,000	\$20,000			
Pavement Coordination		\$5,000	\$5,000			
Performance Grade Binders			\$30,000			
<i>IA. Total</i>	<i>\$326,110</i>	<i>\$343,659</i>	<i>\$364,889</i>			
IB. Mandated Funds:						
TRB	\$64,635	\$64,635	\$64,635			
NTPEP	\$4,500	\$6,000	\$4,500			
(TSP) ²			\$6,000			
<i>IB. Total</i>	<i>\$69,135</i>	<i>\$70,635</i>	<i>\$75,135</i>			
IIA. Administration Total	\$85,000	\$100,000	\$100,000			
IIB. Studies Total	\$70,307	\$13,688	\$0			
IIIA. URI Projects						
2 (28) – 2276	\$103,111					
2 (28) – 2277	\$66,374					
2 (28) – 2278	\$75,000					
2 (28) – 2279	\$75,120					
2 (28) – 2282		\$60,000				
2 (28) – 2283		\$50,000				
2 (28) – 2284		\$74,982				
2 (28) – 2285		\$27,500				
2 (28) – 2286		\$87,000				
2 (28) – 2287		\$16,971				
2 (29) – 2288			\$63,000			
2 (29) – 2289			\$62,000			
2 (29) – 2290			\$75,000			
2 (29) – 2291			\$80,000			
2 (29) – 2292			\$46,000			
<i>IIIA. Total</i>	<i>\$319,605</i>	<i>\$316,453</i>	<i>\$326,000</i>			
IIIB. RIDOT Projects						
2 (28) – 2274	\$61,000					
2 (28) – 2275	\$25,000					
2 (28) – 2280		\$23,000				
2 (28) – 2281		\$20,000				
<i>IIIB. Total</i>	<i>\$86,000</i>	<i>\$43,000</i>	<i>\$0</i>			
Total Expenses	\$956,157	\$887,435	\$990,024			
INCOME						
SPR Fed. Funds (25%) (a)	\$759,591	\$925,722	\$885,857			

Pooled Funds	(b)	\$326,110	\$343,659	\$364,889	
(a) - (b)	(c)	\$433,481	\$582,063	\$520,968	
125%(c)	(d)	\$541,851	\$727,579	\$651,210	
(b) + (d) Total Income		<i>\$867,961</i>	<i>\$1,071,238</i>	<i>\$1,016,099</i>	
Income minus expenses		(\$88,196)	\$183,803	\$21,075	
<i>Total Income for SAFETEA: Total Expenditures/Commitments</i>					<i>\$116,682</i>

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R&T Organization/Responsibilities Chart

